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JP 620183790 A US 5068983 A US 4756949 A

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(54) Laminated supports for pressure relief

(57) A laminated support for pressure-relief such as mattresses or cushions comprises at least two layers of foam adhered together, at least one layer consisting of a visco-elastic foam. In embodiments the support may comprise two layers of viscoelastic foam adhered together, one layer having a greater hardness than the other (figures 1 and 2) together with a layer of highly resilient foam (figure 3).These layers are sandwiched between two layers of reticulated filter polyurethane foam.

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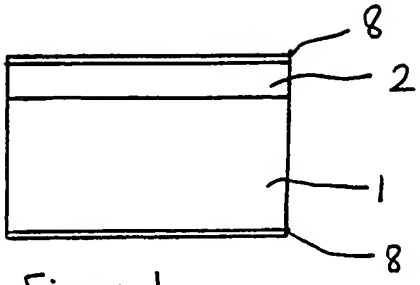

Figure 1

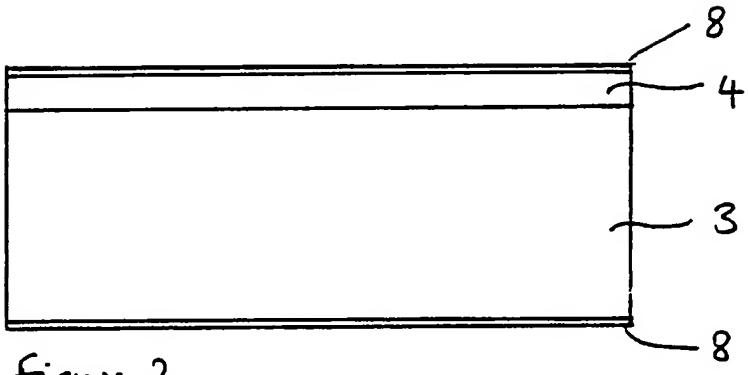

Figure 2

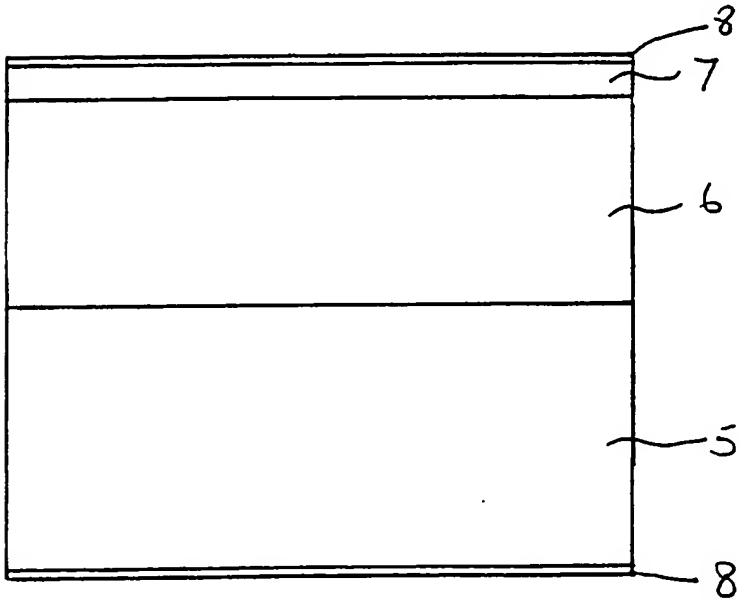

Figure 3

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LAMINATED SUPPORTS

This invention relates to laminated supports for pressure-relief.

Mattresses and cushions used every day in homes and hospitals are not well-suited for people requiring pressure-relief. In hospital, for example, long-term patients often suffer from pressure sores.

The present invention therefore seeks to provide improved supports, such as mattresses and cushions, for pressure-relief.

According to the present invention there is provided a laminated support for pressure-relief comprising at least two layers of foam adhered together, wherein at least one layer is a visco-elastic foam.

In one embodiment, the laminated support comprises two layers of visco-elastic foam adhered together, wherein one layer of visco-elastic foam has a greater hardness than the other layer. The laminated support may further comprise a layer of polyurethane foam adhered to the layer of visco-elastic foam having the greater hardness.

In another embodiment, the laminated support comprises a single layer of visco-elastic foam and a single layer of polyurethane foam adhered together.

The visco-elastic properties of the laminated support respond to a combination of body weight and body temperature. Thus, the support gently moulds to the body allowing pressure to be absorbed uniformly and distributed evenly. This property is of particular benefit in the prevention and healing of pressure sores.

Examples of the present invention will now be described, by way of example only, with reference to the accompanying diagrammatic drawings, in which:

Figure 1 shows a vertical cross-sectional view of a cushion according to the present invention;

Figure 2 shows a vertical cross-sectional view of a mattress overlay according to the present invention; and

Figure 3 shows a vertical cross-sectional view of a mattress according to the present invention.

The cushion shown in Figure 1 is manufactured from a bottom layer 1 of 40mm thick visco-elastic foam having a density of 110kg/m^3 and a hardness of 30N, and a top layer 2 of 10mm thick visco-elastic foam having a density of 85kg/m^3 and a hardness of 10N.

The overlay shown in Figure 2 is manufactured from a bottom layer 3 of 60mm thick visco-elastic foam having a density of 83kg/m^3 and a hardness of 13N, and a top layer 4 of 10mm thick visco-elastic foam having a density of 83kg/m^3 and a hardness of 10N.

In another example, an overlay is manufactured from a bottom layer of 80mm thick highly resilient polyurethane foam having a density of 35kg/m^3 and a hardness of 12N, and a top layer of 70mm thick visco-elastic foam having a density of 82kg/m^3 and a hardness of 13N.

The overlay can be placed on top of an existing mattress to provide extra comfort and pressure-relief.

The mattress shown in Figure 3 is manufactured from a bottom layer 5 of 75mm thick polyurethane foam having a density of 35kg/m^3, a middle layer 6 of 60mm thick visco-elastic foam having a density of 83kg/m^3 and a hardness of 13N, and a top layer 7 of 10mm deep visco-elastic foam having a density of 83kg/m^3 and a hardness of 10N.

Suitable polyurethane foams are manufactured by A/S Dan-Foam, 5560 Arup, Denmark. One example of a polyurethane foam has the manfacturer's code HE35S.

Similarly, suitable visco-elastic foams are made by A/S Dan-Foam, 5560 Arup, Denmark and sold under the

trade mark TEMPUR. One such visco-elastic foam has the manufacturer's code T-85. A preferred range of density of the visco-elastic foam is 50 to 120kg/m^3.

In each case, the layers comprising the cushion, overlay or mattress, are adhered together using an environmentally-friendly water-based adhesive such as SABA AQUABOND RSD (trade mark), a two-component water-based adhesive produced by SABA DINXPERLO BV, B-7090 AA DINXPERLO, Belgium.

All hardnesses are measured at 65% compression at 20°C.

Once the appropriate layers of foam have been adhered together, a 2mm thick sheet 8 of a reticulated filter polyurethane foam is adhered to each outer face of the laminated support. This layer 8 is air permeable.

The laminated support may be provided with an outer covering (not shown). Two examples of outer coverings are described below.

One example is a textile net cover followed by a removable outer fabric cover. The textile net cover eases the taking on and off of the fabric cover and is made from a specially treated textile which allows the foam layers to 'breathe' whilst preventing contamination of the foam layers by fluids. An example of such netting is the 100% cotton netting manufactured by BODET & HORST GmbH & Co KG, D-4460 Hörstel, Germany.

A second example of an outer covering is a waterproof, vapour-permeable cover made of base nylon fabric coated with polyurethane film. Preferably, this cover material is 0.25mm thick, weighs 245g/m^2, and is constructed having a single sheet top surface, no joins, welded seams and a sealed zip flap. In addition, this cover may be pretreated with an anti-bacterial agent.

The laminated support of the present invention, when covered with the polyurethane coated nylon material,

ensures good hygiene for patients with incontinence. The elasticity of the cover allows the pressure-relieving properties of the visco-elastic foam to be unimpaired.

Laminated supports manufactured in accordance with the present invention allow air to circulate around a patient's skin and thus avoid the discomfort of perspiration and skin irritation.

The visco-elastic foam layers provide the laminated support with its special pressure-relieving properties. The support is thus able to mould according to the weight and temperature of a body in contact therewith. When the body is moved from a particular point of contact, the support quickly regains its initial shape, ready to be re-moulded.

This property of the support is different to normal polyurethane foams which bulk up when compressed, thereby exerting pressure rather than relieving it.

In use, it is the side of the support which has the visco-elastic foam layer, or the softest visco-elastic foam layer, foremost which is arranged for contact with a person's body. As a result, the support does not need to be turned, as is customary with hospital mattresses, for example.

CLAIMS

1. A laminated support for pressure-relief comprising at least two layers of foam adhered together wherein at least one layer consists of a visco-elastic foam.

2. A laminated support as claimed in Claim 1 comprising two layers of visco-elastic foam adhered together wherein one layer of visco-elastic foam has a greater hardness than the other layer.

3. A laminated support as claimed in Claim 1 comprising a layer of visco-elastic foam and a layer of polyurethane foam adhered together.

4. A laminated support as claimed in Claim 2 further comprising a layer of polyurethane foam adhered to the layer of visco-elastic foam having the greater hardness.

5. A laminated support as claimed in any preceding claim wherein a layer of reticulated filter polyurethane foam is adhered to the free face of each outer foam layer.

6. A laminated support as claimed in any preceding claim which is provided with a waterproof vapour-permeable outer cover.

7. A method of manufacturing a laminated support comprising adhering together layers of foam in order to form the laminated supports claimed in Claims 1 to 6.

8. A laminated support substantially as hereinbefore described with reference to the accompanying drawings.

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ıtents Act 1977 'xaminer's report to the Comptroller under Section 17 (The Search report)	Application number GB 9411120.0
Relevant Technical Fields (i) UK Cl (Ed.M) B5N (ii) Int Cl (Ed.5) B32B 5/32 A47C 27/14, 27/15	Search Examiner R J MIRAMS Date of completion of Search 23 SEPTEMBER 1994
Databases (see below) (i) UK Patent Office collections of GB, EP, WO and US patent specifications. (ii) ONLINE DATABASES: WPI, CLAIMS	Documents considered relevant following a search in respect of Claims :- 1 to 8

Categories of documents

X:	Document indicating lack of novelty or of inventive step.	P:	Document published on or after the declared priority date but before the filing date of the present application.
Y:	Document indicating lack of inventive step if combined with one or more other documents of the same category.	E:	Patent document published on or after, but with priority date earlier than, the filing date of the present application.
A:	Document indicating technological background and/or state of the art.	&:	Member of the same patent family; corresponding document.

Category	Identity of document and relevant passages	Relevant to claim(s)
X	US 5068983 A (MARC) eg column 3 lines 58 to 62	1,3,7
A	US 4756949 A (SPENCE) whole document	1,7
A	WPI Abstract Accession No 92-224165/27 and JP 62183790 A (SANSHIN) 12 August 1987 (see abstract)	1,7

Databases: The UK Patent Office database comprises classified collections of GB, EP, WO and US patent specifications as outlined periodically in the Official Journal (Patents). The on-line databases considered for search are also listed periodically in the Official Journal (Patents).